SONY Broadcast

BVH-1000

1″ High-Band Video Recorder

Sony Broadcast presents the BVH-1000— an advanced 1" high-band video recorder destined to revolutionize video production and broadcasting techniques.

The benchmarks of achievement in any industry are few and far between.

Today, Sony Broadcast is establishing such a benchmark in the video industry, with a remarkable new 1" professional video recorder. The BVH-1000.

The Sony Broadcast BVH-1000 represents a change that will affect every aspect of television broadcasting and production, from news gathering in the field to program and commercial production in the studio.

The change began with Sony helical-scan videocassette equipment, and with the technique known as Electronic News Gathering.

Sony ENG equipment took the first step toward breaking down the conceptual barrier between film and video. But a major obstacle remained in the way of complete acceptance of video production techniques: the quadruplex broadcasting standard.

Production methods possible with quadruplex segmented-format video tape recorders lack many of the advantages of film production methods. Quadruplex VTRs alone, without substantial electronic storage systems, do not allow the rapid shuttle speeds, manual jogging, and still-frame with recognizable pictures that film editors depend on. Film producers use single-camera techniques and save a major part of their creative effort for the editing process; video producers dependent upon on-line quadruplex editing techniques have been forced to rely on multiple-camera studio techniques and perform their editing "on the fly," using production switchers.

Consider the concept.

Sony video engineers went to work on the problem. And in 1976, Sony Broadcast unveiled the solution. A new concept in professional broadcast video recording. The BVH-1000.

The BVH-1000 is a high performance 1" helical-scan video recorder utilizing the NTSC high-band direct FM recording system.

For the first time, the BVH-1000 offers broadcasters a video recorder that combines the electronic advantages of quadruplex production with the picture continuity and nonreal-time editing ease of film.

For the first time, the full creative potential of film editing and production techniques can be expressed electronically on video tape—with dramatic savings in time and money.

For the first time, there's a true alternative to quad. And television broadcasting may never be the same.

Consider the advantages.

The Sony Broadcast BVH-1000 gives broadcasters and producers the best of both worlds.

Compared to quad, the BVH-1000 represents significant advantages. The first is transparent picture quality. Picture quality equal or superior to that of quadruplex. With a minimum signal-to-noise ratio of 48 dB.

The second great advantage of the BVH-1000 is economy. The BVH-1000 costs less to acquire. Needs less space, so you save on studio room. Uses less power, so you save on electrical costs. Requires less maintenance. And most important, the BVH-1000 uses 1" tape. Tape that costs about half the price of 2" quad tape. Say you use between 50 and 100 reels of tape each year—figure out what that means in terms of savings. In five to eight years, your initial BVH-1000 investment has paid for itself!

Compared to film, the BVH-1000 eliminates an entire production step: film developing. So you save more. And yet the BVH-1000 retains all the editing and production advantages of film.

Advantages like single-camera technique. 100% post-production editing capability. High-speed shuttle tape search and manual tape jogging, with recognizable pictures. High fidelity multiple audio tracks. Color framing, to maintain perfect timing continuity during editing and animation sequences. And more.

Consider the possibilities.

The BVH-1000 opens up a broad range of new opportunities for broadcasters and production houses.

Think about the local programming capabilities you have with the BVH-1000. Capabilities the quadruplex format can't match. With an economy that leaves film far behind.

Think about creating your own documentaries. Taping your own commercials, to increase your station revenue. Think about taking your 1" video format into the field, with editing capability—and with a compact 1" portable recorder that extends the BVH concept even further.

Think about the kind of panoramic productions that once could be accomplished only on film. Think about what single-camera film editing techniques will mean to your creative effort.

Speed. Economy. Flexibility. Creative freedom.

They all add up to a new era in television broadcasting. The era of 1" helical video recording. The era of the Sony Broadcast BVH-1000.

Consider the source.

There's one more thing you should think about as you consider the move to 1" tape format.

The source of your equipment.

And when you consider the source of the BVH-1000, you'll find advantages no other 1" video format can match.

The BVH-1000 gives you the benefit of Sony's years of experience in research, engineering, and production of video systems. Experience that has earned Sony a reputation for technological leadership in the video industry. And made us the world's largest producer of sophisticated video equipment.

The BVH-1000 gives you access to a complete system of factory-matched video components from a single manufacturer.

And the BVH-1000 gives you Sony reliability. Achieved by rigid quality control techniques perfected over the course of manufacturing several hundred thousand video recorders. And backed by Sony Broadcast service. Service you can count on.

The BVH-1000 1" High Band Video Recorder, from Sony Broadcast.

All things considered, it's the most exciting new product on the television broadcast horizon.

1. Omega – the symbol of a new era in television broadcasting: 1" helical video recording with the picture quality of quadruplex and the editing ease of film.

2–4. The Sony Broadcast BVH-1000 – giving broadcasters and producers creative freedom and operational flexibility in studio or mobile van installations. (Photographed at NBC installations through the courtesy of NBC)

The Sony Omega format—advantages no other 1" tape format can match.

Shared-sector scanning. To appreciate the unique advantages of the Sony Broadcast BVH-1000, begin at the beginning. With the Omega format itself.

The BVH-1000 incorporates an exclusive video head system we call "shared-sector scanning." With this system, video and vertical blanking interval are recorded by separate heads having identical characteristics. One head scans the visible sector of the field (lines 18-263); a second full bandwidth head scans part of the vertical blanking interval (lines 1-17). Head switching occurs before the vertical interval reference signal (VIRS). Video information, including VIRS, is processed by the active video head, eliminating the possibility of loss of correlation between VIRS and visual signal.

Shared-sector scanning retains the primary advantages of one-head and two-head helical-scan systems, while eliminating the disadvantages of both. Since all video is derived from a single head, the BVH-1000 system is immune to color banding. And the BVH-1000 offers the further important advantage that all lines of every field are fully reproduced. The entire vertical blanking interval is captured and available for encoding VIRS, VITS, VITC, CEEFAX, or any other special signal required in the future.

High fidelity audio. One look at the track pattern of the BVH-1000 will show you another major advance of the Sony Omega format: high fidelity audio.

The BVH-1000 has been specially designed to deliver a much higher level of audio performance than any previous production video recorder. Two 0.8mm audio tracks separated by a 0.8mm guardband yield true high fidelity audio with sufficient crosstalk isolation (−50 dB at 1 kHz guaranteed) for independent use, allowing broadcasters and producers new opportunities for high quality stereo programming and second-language transmission via simulcast techniques.

The BVH-1000 audio signal achieves a signal-to-noise ratio of 56 dB without Dolby noise reduction. It's the kind of audio quality you'll need for multiple generations. The kind of audio quality the mastering and post-production video recorder of the future must be able to attain.

Isolated address track. Location of the address track at the opposite edge of the tape from both audio and control tracks is another significant benefit of the Sony Omega format.

This isolation of the address track gives it important capabilities not available in other recording formats. During normal playback, the address track can perform as a third

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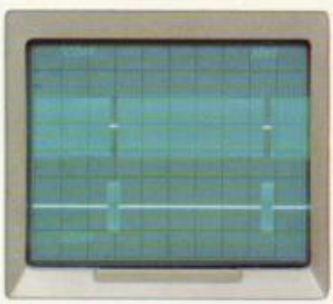


high fidelity audio channel. Its automatically switched-in wideband amplifier makes it suitable for SMPTE time code processing in BIDIREX search modes. And it permits use of a built-in 400 Hz cue tone for convenient indexing purposes.

To facilitate more flexible use, two output connectors are provided: BNC for time code applications and XLR for audio use.

Isolated control track. It is vitally important for a production and broadcasting video recorder to isolate and protect the control track from any possible interference. The Sony Omega format does just that.

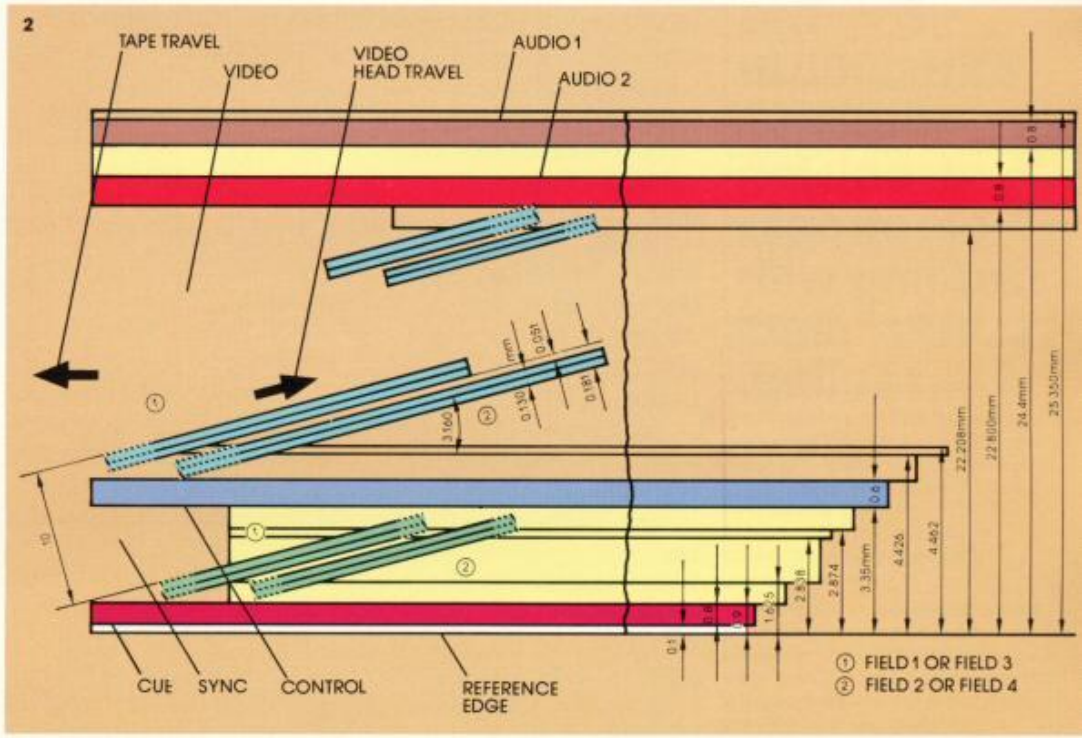
The control track is placed between the video and sync tracks, completely isolating it from the danger of crosstalk from pulsed time code signals on the address track. It is also protected from momentary loss of servo due to edge damage on the tape itself, an important precaution during broadcasting.

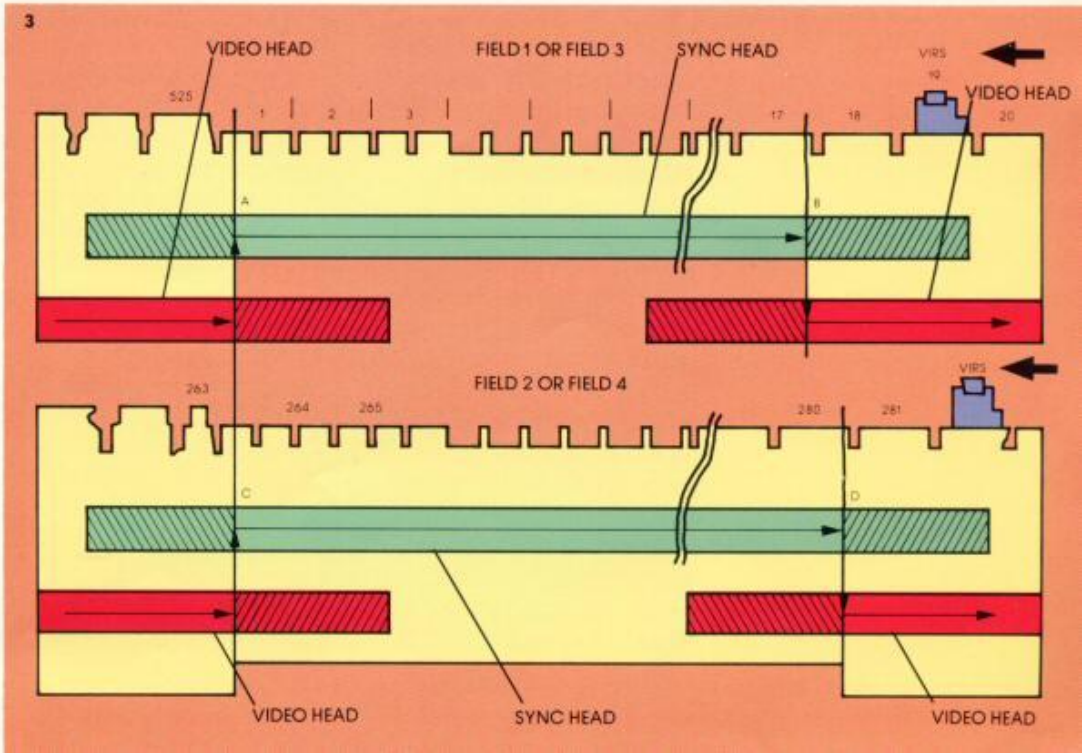
Sony Broadcast believes that the location of all four longitudinal tracks (audio 1, audio 2, address, and control) in the Omega format offers the most logical and effective solution to the problem of crosstalk, and reaches a level of performance unequalled by any other format. Add this to the advantages of shared-sector scanning, and the BVH-1000 becomes the standard against which all other 1" recorders must be tested.

1. Waveform patterns of blanking interval and RF envelope demonstrate that all lines of every field are captured and fully reproduced.

2. Track Pattern of the BVH-1000 – note the 0.8mm width of the two audio tracks, the 0.8mm guard-band between them, and the effective isolation of both address track and control track. No other 1" video recorder can match the levels of performance attained by the Sony Omega format.

3. BVH-1000 Head Switching Points – shared-sector scanning by two separate video heads with identical characteristics allows the BVH-1000 to reproduce all lines of every field. The entire vertical interval is available for time code information. Video information, including VIRS, is processed by the active video head, eliminating the possibility of loss of correlation between VIRS and visual signal. And a sufficient overlap between heads, coupled with rapid switching in the vertical interval, effectively guards against the dropout common to single-head video recorders.





The BVH-1000 in action—precision electronic editing with a true "film" feeling.

Sony video engineers set themselves a challenging goal: to create a production video recorder capable of duplicating the "film" feeling top creative editors want, without sacrificing any of the electronic advantages of video editing techniques.

The BVH-1000 achieves that goal. And surpasses it.

BIDIREX—a Sony exclusive. The first dramatic post-production advantage of the BVH-1000 is BIDIREX, Sony's answer to moviola-type film editing.

With BIDIREX, a single control dial gives full bi-directional search capability, allowing the editor to make fast decisions with a high degree of accuracy. Not one, but two search modes are provided.

In normal shuttle mode, the BIDIREX control dial permits smooth variation of tape shuttle speed in both forward and reverse. Tape speeds increase in either direction from still, step, 1/4 speed, normal speed, 3X, 5X, 10X, 25X, up to 60 times normal speed in fast forward and reverse. Color lock of the picture is maintained in forward and reverse up to a minimum of seven times normal speed; when color lock is lost, the picture remains recognizable even at more than 30 times normal speed when a Sony BVT-1000 Digital Time Base Corrector is used. The BIDIREX control dial operates smoothly through all forward and reverse speeds, while LED readout gives the operator a constant graphic display of tape direction and speed. And during rapid search, a special electronic circuit acts to suppress the noise bar so that viewing and editing cause less operator fatigue.

In jog mode, the BIDIREX control dial accomplishes the dream of video editors everywhere: the ability to position the tape reels as if by hand. As the operator rotates the BIDIREX dial, both tape reels follow smoothly and effortlessly. The control dial in jog mode has no position stops, and centers itself automatically after each mode change. Best of all, the BVH-1000 retains a fully locked color picture frame by frame, so the operator can monitor his edit point with unerring precision.

Full editing flexibility. And the BVH-1000 gives you editing control unequalled in helical scan recorders.

Important performance capabilities such as video/sync erase, independent audio channels 1 and 2, independent address and control tracks, and field, frame, or color frame edits.

They all combine to permit assemble or individual insertion of video and/or up to three audio channels. In addition, delay between video and audio events is effectively zero.

Add these features to a logic system ideally suited to computer marking and computer-assisted editing, and for the first time post-production editing becomes easier on videotape than on film.

Color framing. Color framing is a potentially important feature of the BVH-1000 for future video operations.

Some high end production recorders don't offer color framing. Others make it available as an expensive option. But the BVH-1000 offers color framing as standard equipment.

A capstan servo lock switch can select reference sync modes: COLOR FRAME, FRAME, and FIELD.

Color framing makes the BVH-1000 particularly effective in commercial production, for many broadcasters an important new source of revenue. In animation sequences, the BVH-1000 color frame system provides correct field-to-field timing relationships in playback video.

Concurrent tape timers. While you edit, the BVH-1000 keeps track of your position with a sophisticated tape timer system.

Two timers, acting independently, provide for a variety of record keeping systems and avoid the loss of vital timing data.

Timer 1 is controlled by a three-way switch on the optional CG-1000 Time Code Generator/Reader. This switch selects the information to be shown on the BVH-1000 counter display: elapsed time from the linear mechanical tape counter, SMPTE time code, or user bits. The Time 1 mechanical tape counter is resettable.

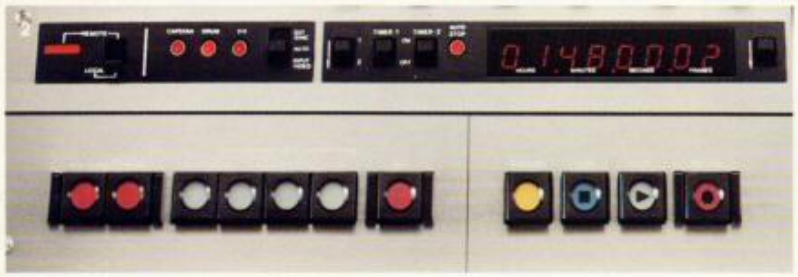
Timer 2 holds in memory the program time from the beginning of the tape. It cannot be reset, so elapsed time to any point on the tape is preserved. And a display selector switch places the reading from either Timer 1 or Timer 2 on display for quick reference.

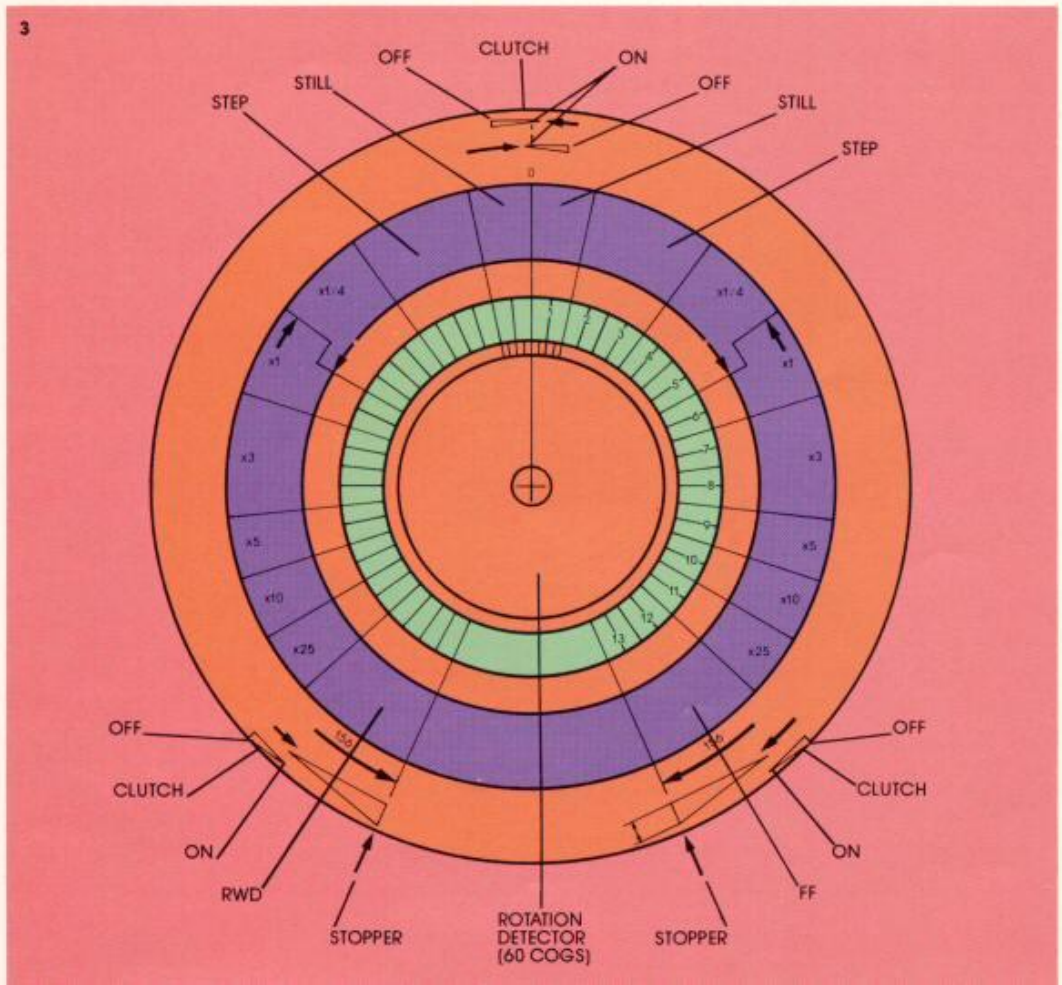
As an added safety feature, the BVH-1000 has a zero memory system which brings the tape to a sure, safe, gentle stop at counter readings of 0.00.00.00 from both fast forward and rewind. Fully automatic programmed deceleration prevents tape damage and accidental loss of leader.

Total editing control.
Put them all together.

BIDIREX. Shuttle speeds from still and step to over 60 times normal speed in both forward and reverse. Jog action as if you were positioning the tape reels by hand. Video/sync rotary erase. Assemble and independent insert editing of video and/or up to three audio channels. A logic system ideally suited to computer marking. Built-in color framing. Concurrent tape timers. And zero memory.

You won't find another production format, video or film, that can match the editing speed, economy, and precision of the Sony Broadcast BVH-1000.





1. **Meter panel—video and audio meters and level controls let you adjust record and playback levels for optimum performance. Waveform monitor selector buttons determine the signals fed to the WFM OUT connector on the rear of the BVH-1000. And audio select buttons allows you to choose audio monitor output from CH 1, CH 2, CH 1 plus CH 2, or CUE track.**

2. **Function control panel—cue, assemble, insert, edit, and tape function controls are all conveniently located beneath servo lock indicators and timer readout and select switches. Everything is grouped together for quick editing decisions.**

3. **BIDIREX—a single control dial gives full bi-directional search capability, with two search modes. In shuttle mode, tape speed varies from still, step, and normal speed to over sixty times normal speed in both forward and reverse. In jog mode, the tape reels follow the rotation of the BIDIREX control dial as if the editor were positioning them smoothly by hand. The BIDIREX control dial has 17 positions (identified by LEDs) spread over 159 degrees of arc. The far left (RWD), center, and far right (FF) positions have click-stop locks.**

The BVH-1000 tape handling system—superbly engineered for correct tension at all speeds, with guaranteed interchange.

In any helical scan video recorder, the flow of the tape around the drum is of critical importance. The angle of the tape must be shaped gradually, to prevent any sharp change in direction. And the tape tension must be maintained with unerring accuracy.

The Sony Broadcast BVH-1000 does both.

Tape guides, rollers, and capstans are arranged to achieve a smooth and gentle tape flow. Tape guides are tilted; the angle of the tape around each guide is kept as low as possible, to reduce longitudinal vibration. And all steel parts of the BVH-1000 tape transport system are placed against the back of the tape, with pinch rollers against the front.

Five servo motors. The BVH-1000 features an advanced servo system that maintains correct tape tension at all BIDIREX search speeds.

Three-phase synchronous motors drive the BVH-1000 scanner and two capstans. Two additional eddy-current motors are used for supply and take-up reels. There are five direct coupled servo motors in all—enough to provide completely controlled tape-handling action at all times.

A precision V-lock scanner servo compares incoming video or house sync with playback signals, to maintain precise signal-phase relationships through all edit transitions.

The drive capstan insures constant tape speeds during recording and obeys BIDIREX control dial commands in shuttle and jog search modes. A selector switch permits the operator to lock the drive capstan in field, frame, or color-frame modes.

The tension capstan servo uses a sensitive differential transformer to detect and correct minute changes in tape tension. In playback, this servo is augmented by an automatic skew control system that compares playback horizontal sync with house sync or incoming video. Skew errors at the head-switching point are reduced to less than 350 nanoseconds.

Supply and take-up reel servos preserve complete torque and brake control in both forward and reverse, coordinating direction of rotation, speed, and the relative amount of tape on each reel to protect your valuable master tapes through the rigors of fast editing operations.

And the BVH-1000 five-motor system eliminates the need for unreliable belt drives. Reels, capstans, and scanner are all directly controlled by their own servo motors.

Interchange is guaranteed. In all broadcast and production video applications, tape interchange is vital.

In the BVH-1000, 1 dB down on an interchange basis is guaranteed.

A revolutionary computer-machined non-linear rabbet guides the reference edge of the video tape around the scanner, actually keeping within 10 microns peak-to-peak of the designated tape position over the entire 400mm length of the tape travel path.

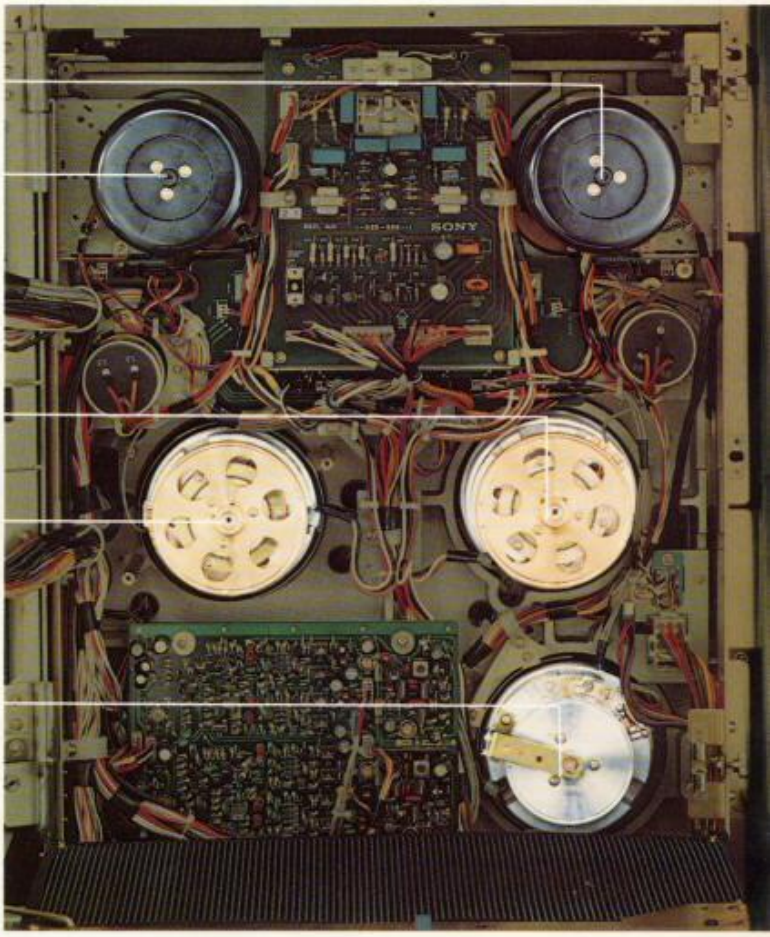
The tape runs smoothly around the drum, guided by the non-linear rabbet and by entrance/exit guides adjustable to within one micron in both height and angle. An extremely high level of tracking linearity is assured, without dynamic correction.

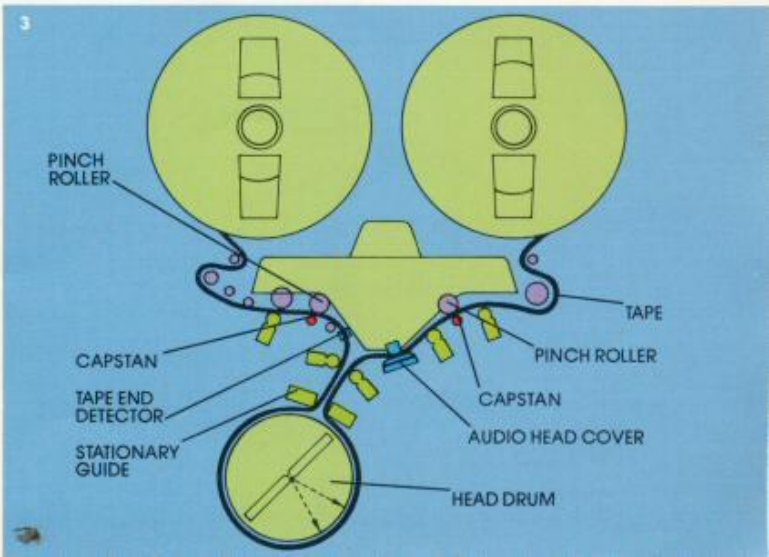
Sony's interchange is guaranteed by years of dedication to precision mechanics. And supported by the experience of building several hundred thousand video recorders.

1. Advanced servo system – five direct-coupled servo motors provide individual control of the scanner, the drive capstan, the tension capstan and both tape reels, insuring precision edits and smooth, gentle tape handling at all speeds. And no belts are used as drives in the BVH-1000.

2. Head drum assembly – a non-linear rabbet guides the reference edge of the tape around the scanner, maintaining accuracy within 10 microns peak-to-peak of its designated path over the entire 400mm length of its travel path.

3. Omega wrap configuration – note the location of guides, rollers, and capstans to achieve a gentle, fluid tape path.





Another Sony Broadcast advantage—the logic of a systems approach.

The BVH concept doesn't stop with our 1" production recorder.

Sony Broadcast is committed to a systems approach to video. And that means not just studio recorders, but professional portable 1" recorders that bring the Omega format out into the field. Time base correctors that interface directly with the BVH-1000, providing high-quality time base error correction and picture stability in high-speed search and editing operations. Interface connection for external TTL control from a remote control unit, automatic editors, computers, or another BVH-1000. And a time code generator/reader that increases the flexibility of SMPTE time code processing and reading techniques.

Consider the components of the Sony Broadcast BVH system.

BVH-500 Portable 1" High-Band Recorder.
A fully professional portable unit that combines the advantages of the Sony 1" recording format with the field requirements of small size, light weight, and battery operation. All basic specifications, such as tape format, carrier mode, etc., are identical to the BVH-1000, giving you the advantage of being able to record in the field, then edit directly on 1" tape.

Up to 60 minutes of recording time is provided with a single 9" reel of Sony V-16 1" high density video tape. Electronic tape tension control gives maximum stability and performance. B/W playback capability for on-location monitoring, direct time code recording and playback capability, quick record current optimization in the field, and rugged weather-proof housing all combine to make the BVH-500 an outstanding performer under any field conditions.

BVT-1000 Digital Time Base Corrector.
The BVH-1000 may be used with any standard TBC. But pairing the BVH-1000 with the Sony Broadcast BVT-1000 yields several important advantages.

Color pictures are locked and recognizable from still-frame to seven times normal speed; recognizable monochrome pictures are maintained at shuttle speeds greater than thirty times normal speed. A unique A/D converter expands the effective number of bits per word, resulting in a higher signal-to-noise ratio than

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theoretically expected from an 8-bit system. And advance sync control allows phase correction using LED indicators at the time base corrector, for true system integration.

BVR-1000 Remote Control Unit, with Auto Editing. A high-performance remote control accessory that lets you control all basic BVH-1000 functions from a screening room or master control room as far as 330 feet away. Status indicator lamps reflect mode, timer, and servo functions. In addition, the BVR-1000 provides simple automatic editing capability. Cut-in edit points on a BVH-1000 recorder may be pre-rolled and parked awaiting an edit command.

BVG-1000 Vertical Interval Time Code (VITC) Generator/Reader. Designed and developed for studio master, local master/slave, and mobile van applications, the BVG-1000 not only generates standard SMPTE time code, but adds time code into the vertical interval of the video signal being processed.

SMPTE time code can be read at slow speed and still-frame, allowing greater convenience and opening up unlimited possibilities for new computer assisted editing techniques. With a SMPTE time code generator, reader, and character generator packaged in one unit, the BVG-1000 offers broadcasts significant advantages over existing time code equipment.

1. BVH-500 – a professional portable 1" recorder fully interchangeable with the BVH-1000. Providing recording time of up to sixty minutes, the BVH-500 combines the professional advantages of the Omega format with battery operation, small size, light weight, and rugged weather-proof construction.

2. BVT-1000 – a digital time base corrector that features built-in line-by-line velocity compensation, complete video processing with advance sync, drop-out compensation, and the ability to handle both direct and heterodyne color.

3. BVR-1000 – a remote control accessory that lets you control all basic BVH-1000 functions from up to 330 feet away. In addition, two BVR-1000 units with two BVH-1000 recorders will provide simple automatic editing capability (manual cut out).

4. BVG-1000 – a versatile time code generator / reader that takes internal or external SMPTE time code and provides a new time code in the vertical interval of the video. The BVG-1000 also performs standard SMPTE functions and character generation.

The BVH-1000—built to Sony Broadcast standards of serviceability, versatility of installation, and ease of operation.

The entire BVH-1000 package has been engineered by Sony to achieve a level of simplicity and sophistication that will insure the kind of reliability, flexibility, and performance you need in a top-of-the-line video recorder.

And Sony's commitment to quality control means that each BVH-1000 we deliver is built to the highest standards of electrical and mechanical precision. Built, in other words, the way only Sony can build video recorders.

When you evaluate the professional recorders available today, no matter what format or tape width, you'll find no match for these features of the Sony Broadcast BVH-1000.

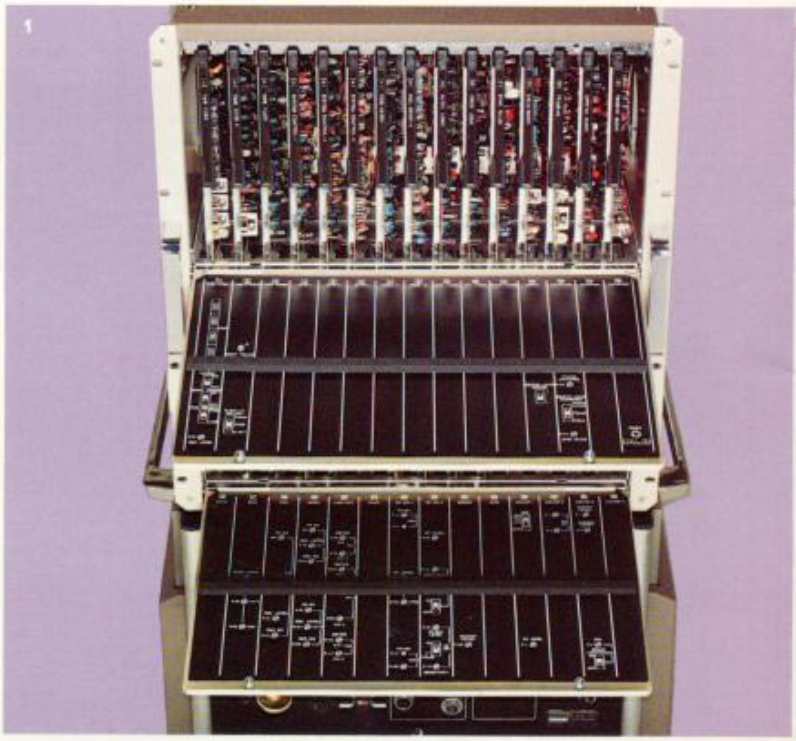
Versatile component design. The BVH-1000 consists of five modular subsystems: tape transport section, electronics package, operating control panel, meter panel, and power supply. All five sections can be separated for rehousing in any desktop, console, or rack-mount configuration. Separate shipping cases for each component make the BVH-1000 far more easily transportable than its weight and size would indicate. And component design also makes servicing quicker and simpler.

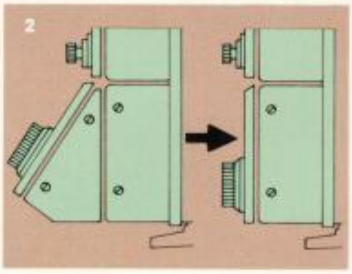
Circuit board electronics. The main circuit systems of the BVH-1000 are mounted in PC boards, and each function or major circuit is on a separate board or combination of boards for quick access. Nothing is spread across unrelated boards. All interconnections are on a PC motherboard. And all necessary adjustment and test points are easily located and accessible on these boards.

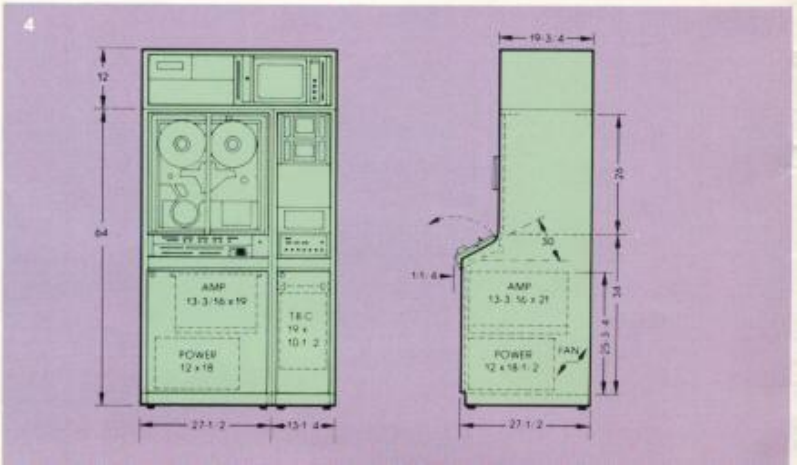
Quick record current optimization. Video record current is optimized in the still-frame mode, where heads read their own recordings at the rep rate of the scanner. It takes only a few seconds to adjust the current; all instrumentation is built into the BVH-1000. Equalization adjustments are also located on the front panel.

Simple head drum replacement. The BVH-1000 video heads are prealigned at the factory in fixed positions on the scanner drum. And the upper drum itself is easily and economically replaced in the field, with ordinary hand tools.

Easy-to-operate controls. The control panel of the BVH-1000 has been







carefully laid out to insure maximum ease of operation and quick operator familiarity. Large level meters (peak-reading for audio) facilitate rapid and accurate level settings. And the large BIDIREX search control dial fits comfortably into an editor's hand and responds quickly to his touch.

Alarm functions. The BVH-1000 is equipped with four alarm functions which detect the absence of signal, shutdown of the rotating drum, temperature rise in the power supply, and overheating of the reel motors. In addition, protective mechanisms release Still Frame and Standby modes automatically after three minutes have passed.

Optional heterodyne color unit. The optional HT-1000 heterodyne processing unit will produce highly stable color playback without the use of a time base corrector, a useful advantage when color playback is required for purposes other than actual broadcast. The HT-1000 is a plug-in option mounted directily onto the BVH-1000 recorder.

Optional time code generator. The CG-1000 SMPTE generator/reader is available as a plug-in option. Time code is recorded on the cue track and displayed on the standard readout when the operator selects. With this option, both mechanical and SMPTE indications are available for frame location.

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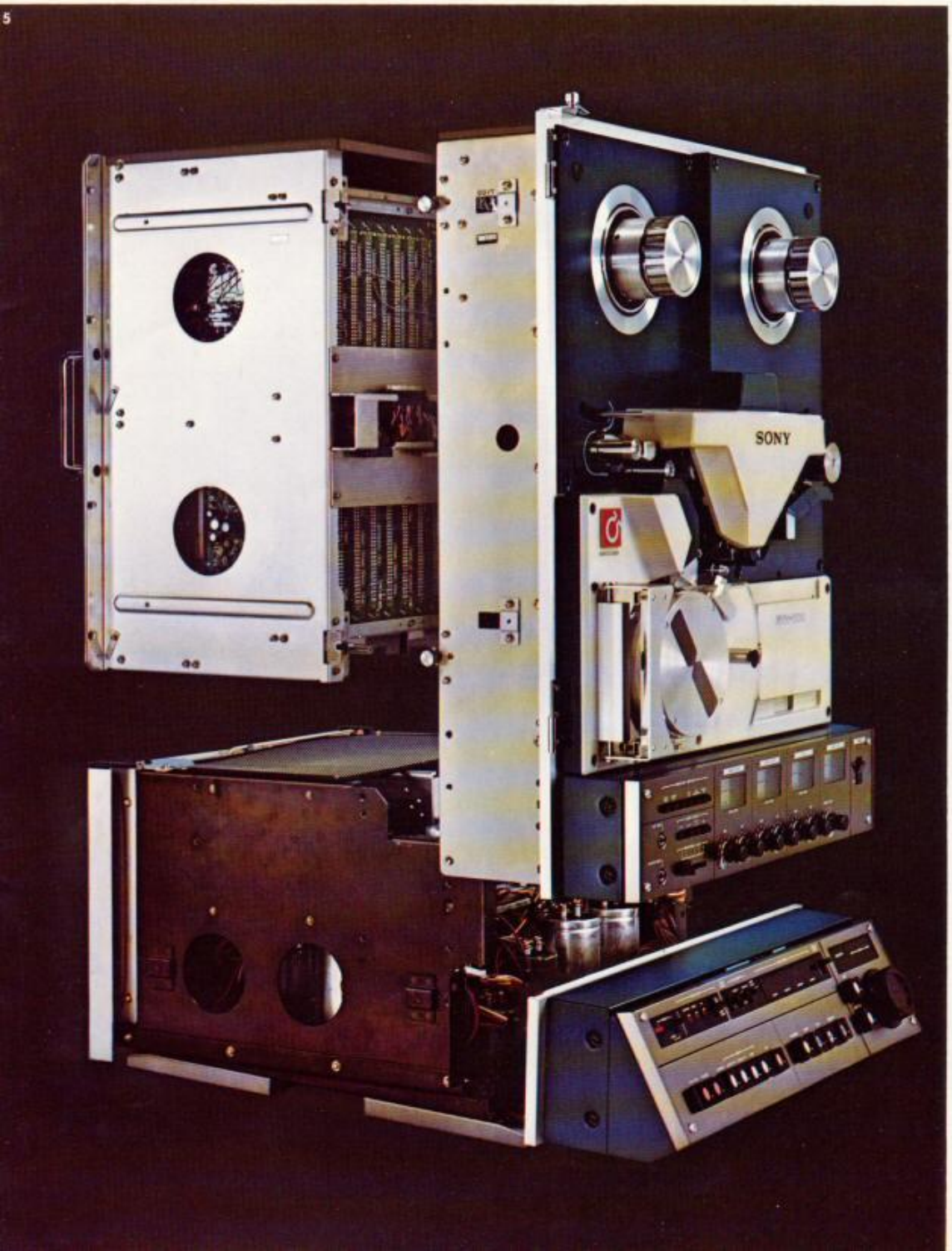


1. **Circuit Board Electronics – for quick and simple servicing, all main circuit systems of the BVH-1000 are mounted in easily accessible PC boards.**

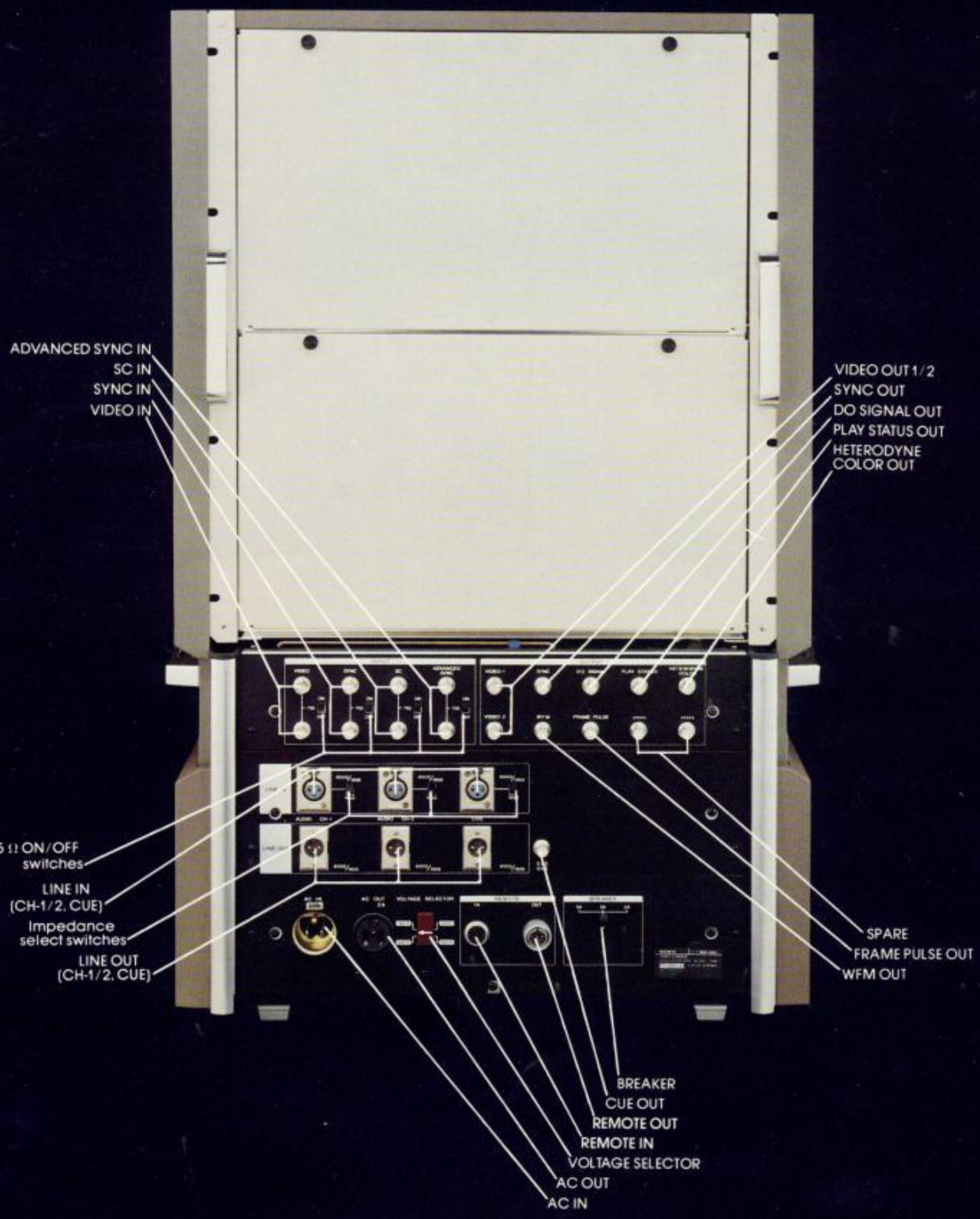
2. **Slanting function control panel – the function control panel is tilted 30 degrees upwards, for more efficient operation. The slanting panel can be removed as required, returning the function control to vertical position.**

3. **Sub-control panel – record current is optimized in still-frame mode, where heads read their own recordings at the rep rate of the scanner. It takes only a few seconds to adjust the current; all necessary instrumentation is built into the BVH-1000.**

4. **Console Version – the BVH-1000 is available in a modular console version, featuring video monitor bridge, monitoring panel, BVH-1000, optional BVT-1000, and power and amplifier compartment.**

5. **Component design – the BVH-1000 breaks down into five modular subsystems: tape transport, electronics package, function control panel, meter panel, and power supply. Each can be packaged separately for easy shipment.**

Anatomy of the BVH-1000


ADVANCED SYNC IN
SC IN
SYNC IN
VIDEO IN
VIDEO OUT 1/2
SYNC OUT
DO SIGNAL OUT
PLAY STATUS OUT
HETERODYNE COLOR OUT
75 Ω ON/OFF switches
LINE IN (CH-1/2, CUE)
Impedance select switches
LINE OUT (CH-1/2, CUE)
SPARE
FRAME PULSE OUT
WFM OUT
BREAKER
CUE OUT
REMOTE OUT
REMOTE IN
VOLTAGE SELECTOR
AC OUT
AC IN

Performance Data and Specifications

BVH-1000

General
Power requirements: AC100/120/220/240 ± 10%, 50/60 Hz
Power consumption: 700 W maximum
Operating temperature: 5° C to 40° C
Humidity: 10% to 90% (noncondensed)
Weight: 120 Kg (265 lbs.)
Dimensions:
574 x 890 x 662mm (W x H x D)
22-5/8 x 35 x 26-1/8 inches
Tape speed: 24.47 cm/sec (9.63 ips)
Writing speed: 25.67 m/sec (1011 ips)
Recording time: 96 min (10.5" reel), 64 min (9" reel)
Wow/flutter: 0.1% rms (NAB unweighted)
FF/REW time (shuttle speed): 90 sec (with 1 hour tape, under 60 Hz operation); 110 sec (with 1 hour tape, under 50 Hz operation)
Tape timer accuracy: timer —1/—2, ± 6 seconds per hour; SMPTE time code (option), ± 1 frame
Recommended tapes: Sony 1" high density tape (V-16 series) or equiv.

Video
Recording system: High band direct FM recording
Carrier 7.06 MHz – 10 MHz
Bandwidth: 30 Hz – 4.2 MHz ± 0.5 dB
Signal-to-noise ratio: 48 dB V (p-p) to RMS noise (interchange basis: 47 dB V (p-p) to RMS noise), measured by Rohde & Schwarz noise meter, unweighted
Differential gain: 4% (with Sony BVT-1000 TBC)
Differential phase: 4° (with Sony BVT-1000 TBC)
Transient response (K-factor): 1%
Moire: —40 dB (75% Color Bars)
Chrominance/luminance delay: 40 n sec
Time base stability: 1 micron/sec (p-p) (VH lock mode)
Input signal:
Video: 1V (p-p) ± 0.3V (p-p)
Sync: 4V (p-p) ± 1.0V (p-p)
S. C.: 2V (p-p) ± 0.5V (p-p)
Output signal:
Video: 1.0V (p-p)
Sync: 4.0V (p-p)

Audio
Frequency response:
Audio CH1 and CH2: 50 Hz to 15 kHz (+1.5 dB —3.0 dB)
Cue (normal mode): 50 Hz to 15 kHz (+2.0 dB —3.0 dB)
Cue (BIDIREX search mode): wide-band
Signal-to-noise ratio:
Audio CH1 and CH2: 56 dB (at 3% distortion level)
Cue (normal mode): 50 dB (at 3% distortion level)
Distortion (at 1 kHz): 1.0% (Audio CH1, CH2 and Cue at operating level)
Crosstalk (between Audio CH1 and CH2 at 1 kHz): —50 dB
Input signal:
Audio CH1, CH2 and Cue: +20 —10 dBm, 600 ohms/10 k ohms balanced)
Cue MIC: —60 dB unbalanced, high impedance
Output signal:
Audio CH1, CH2 and Cue: capability of +4 dBm, +8 dBm, or +10 dBm, 600 ohms/150 ohms, balanced (+31 dBm maximum output)
Cue (for SMPTE time code): 0.5V(p-p)/75 ohms
Headphone: 8 ohms unbalanced

Controls
Normal Function: STOP, PLAY, RECORD, and STANDBY
BIDIREX:
Jog mode: tape speeds from 0 to 5 times normal speed in FWD and REV, according to dial rotation
Shuttle mode: STILL, STEP (1/30), 1/4, 1/1, x3, x5, x10, x25, maximum speed (over 60 times normal speed in both forward and reverse
Edit function: VIDEO, AUDIO CH1, AUDIO CH2 insert edit; assemble edit
Cue function: Cue REC; Cue 400 Hz REC (internal oscillator)
Signal level controls:
Video record
Audio CH1 record
Audio CH1 playback
Audio CH2 record
Audio CH2 playback
Cue record
Cue playback
Headphone

Meters, Indicators
Video/RF meter (in conjunction with Video/RF switch on sub-control panel)
Audio CH1 meter
Audio CH2 meter
Cue meter
Hours meter (indicates head hours in 100-hour segments)
Tape timer indicator in Hours, Minutes, Seconds, Frames, in conjunction with: 1)Timer select switch 1/2, and 2)Timer —1 select switch (optional CG-1000); mechanical timer/SMPTE time code/user bits
Search mode indicator (17 x LED from still to full speed in both forward and reverse)
Servo lock mode indicators (capstan, drum, and VH)
Remote mode indicator
Auto stop indicator (alarm lamp)

Switches
Power on/off
Record inhibit
Video/RF meter select
Record current Sync/OFF/Video
PB/PB, EE/EE
Waveform monitor selector (INPUT VIDEO/DEMOD OUT/SPARE/CTL OUT/RF ENVELOPE/AUDIO OUT)
Audio selector (CH1/CH2/CH1 + CH2/CUE)
REMOTE/LOCAL
Reference sync mode selection (EXT SYNC/AUTO/INPUT VIDEO)
Timer mode selection (TIMER 1/TIMER 2 momentary toggle switch;
Timer 1: SMPTE time code: User bits/Mechanical time (resettable by Timer reset switch); Timer 2: Mechanical time (not resettable by Timer reset switch)
Zero memory ON/OFF (Timer 1 ON/OFF switch; Timer 2 ON/OFF switch)
Timer reset (momentary toggle switch)
Servo lock mode selection (Framing board): Color Frame/Frame/Field
Drop-out signal selection (RF EQ-2 board): RF/DO PULSE (TTL)
Servo lock selection (Drum board): VH (2)/V (1)
Voltage selector: 100/120/220/240 V
Power frequency selector: 50/60 Hz
Others:
2 potentiometers for video and sync record current adjustment in conjunction with SYNC/OFF/VIDEO mode switch and Video/RF meter
2 potentiometers for video and sync RF equalization adjustment Tracking (Preset/Pull on—variable)
Skew (tension board): Auto/Pull on—variable

Connectors
Input:
Video IN-OUT: BNC, 75 ohms ON/OFF
SYNC IN-OUT: BNC, 75 ohms ON/OFF
S.C. IN-OUT: BNC, 75 ohms ON/OFF
Advanced Sync IN-OUT: BNC, 75 ohms ON/OFF
Audio CH1 Line In: XLR-Female, 600 ohms (150 ohms)/10 k ohms, balanced
Audio CH2 Line In: XLR-Female, 600 ohms (150 ohms)/10 k ohms, balanced
Cue Line In: XLR-Female, 600 ohms (150 ohms)/10 k ohms, balanced
AC In: 3-pin AC connector
Remote In: 10-pin multi connector (female)
Cue MIC In: High impedance, unbalanced
Output:
Video 1 OUT: BNC, 75°ohms
Video 2 OUT: BNC, 75 ohms
Sync OUT: BNC, 75 ohms
WFM OUT: BNC, 75 ohms
Do signal OUT: BNC, 75 ohms (RF), High impedance (TTL pulse)
Frame Pulse OUT: BNC, TTL, High impedance
Play Status OUT: BNC, TTL, High impedance
Heterodyne Color OUT: BNC, 75 ohms
Spare: BNC (x2)
Audio CH1 Line OUT: XLR-Male, 600 ohms (150 ohms), balanced
Audio CH2 Line OUT: XLR-Male, 600 ohms (150 ohms), balanced
Cue Line OUT: XLR-Male, 600 ohms (150 ohms), balanced
Cue OUT: BNC, 75 ohms, unbalanced
AC OUT: 3-pin AC connector, 3A max, unswitched
Remote OUT: 10-pin multi connector (male)
Headphone OUT: 8 ohms, unbalanced

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